Coastal Protection and Restoration Authority of Louisiana
Office of Coastal Protection and Restoration

2008 Operations, Maintenance, and Monitoring Report

for

PERRY RIDGE SHORE PROTECTION

State Project Number CS-24
Priority Project List 4

June 2009
Calcasieu Parish

Prepared by:

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2008 Operations, Maintenance, and Monitoring Report
For
Perry Ridge Shore Protection (CS-24)

Table of Contents

I. Introduction

The Perry Ridge Shore Protection project provides features to protect 1,203 ac (481 ha) of vegetated shoreline along the Gulf Intracoastal Waterway (GIWW), which in turn will benefit 5,945 ac (2,378 ha) of predominantly intermediate marsh located north of the shoreline (Figure 1). The project is located in Calcasieu Parish, Louisiana in the Calcasieu-Sabine Basin, Region 4 of the Coast 2050 Plan (Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority 1998). The project extends along the north bank of the GIWW from Perry Ridge to the Vinton Drainage Canal, and is bounded on the north by an arbitrary line connecting the north tip of Big Island and the Gray Canal, on the south by the GIWW, on the east by the Vinton Drainage Canal and the Gray Canal, and on the west by Perry Ridge and Big Island.

The major problem in this region is marsh erosion caused by salt water intrusion, rapid water level fluctuation, and wave action (U.S. Department of Agriculture, Soil Conservation Service [USDA/SCS] 1988). Marsh loss in the vicinity of Perry Ridge has been caused by water level fluctuations and tidal scour resulting from water exchange through breaches in the northern spoil bank and the GIWW (U.S. Department of Agriculture, Natural Resources Conservation Service [USDA/NRCS] 1996).

The shoreline erosion rate of the north bank of the GIWW in the vicinity of the project area is 10 ft/yr (3.05 m/yr), based on aerial photography (USDA/SCS 1992). Several factors contribute to the erosion rate. Double-wide barges, allowed in this section of the GIWW, cause more wake energy to reach the bank. The construction of the Calcasieu Ship Channel, deepening of Sabine Pass, the construction of the Sabine-Neches waterway, and the removal of the bar at the mouth of the Calcasieu River have all resulted in increased water currents in the GIWW. The construction of the GIWW has shifted the project area from an essentially non-tidal system to a tidally influenced system.

The 30 ft (9.1 m) depth of the GIWW allows a very large exchange of water, allowing higher salinities to reach the Perry Ridge area faster than was possible before the GIWW's construction. Historically, the project area consisted of freshwater wetlands (USDA/NRCS 1996). More recently, Chabreck and Linscombe classified this area as an intermediate marsh (Chabreck and Linscombe, 1968, 1978, 1988).

Approximately 23,300 linear ft (7.1 km) of free-standing rock dike was constructed along the north bank of the GIWW from west of Perry Ridge to the Vinton Drainage Canal. Construction of the project was completed in February 1999.

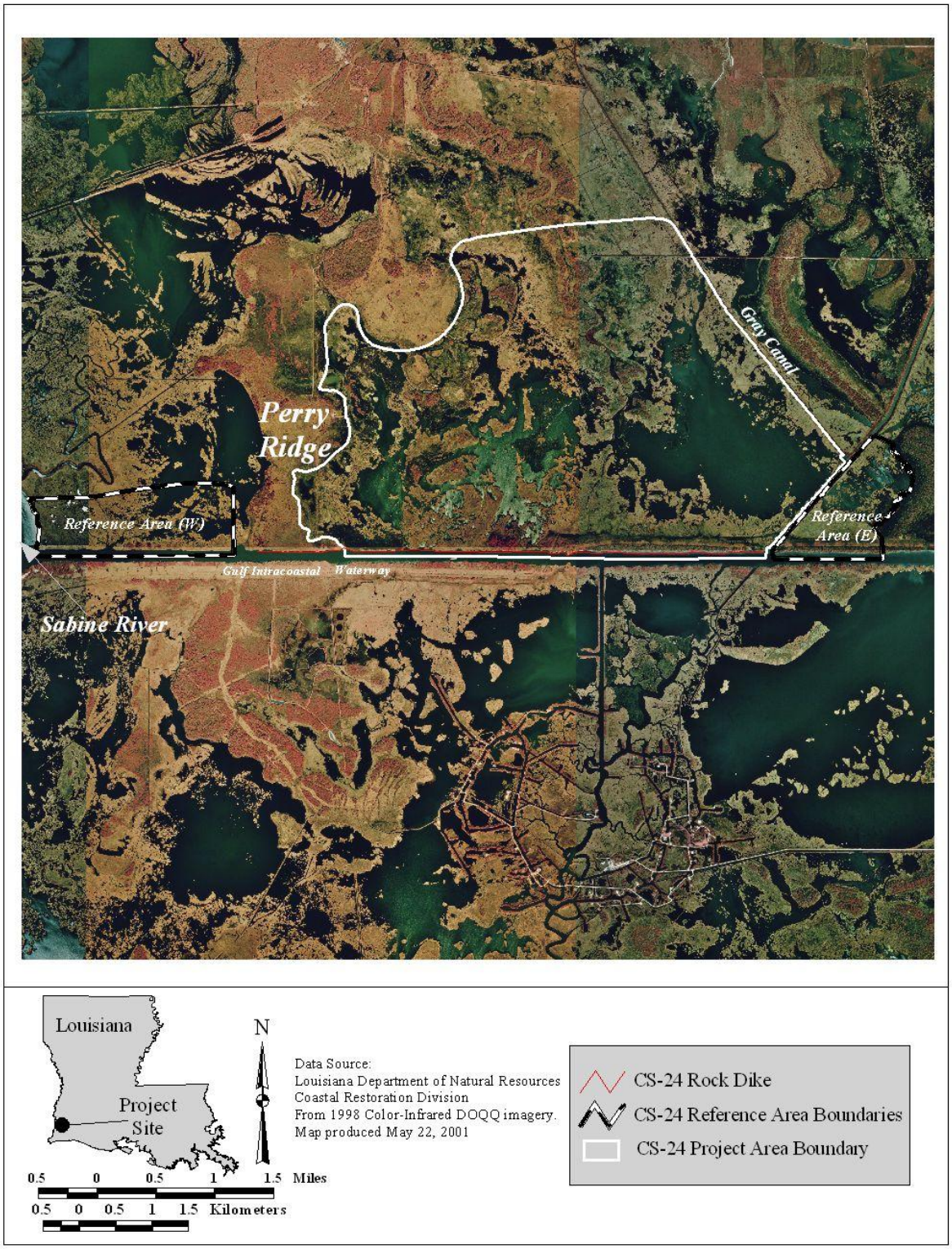

Figure 1. Perry Ridge Shore Protection (CS-24) project boundaries

II. Maintenance Activity

a. Project Feature Inspection Procedures

The purpose of the annual inspection of the Perry Ridge Shoreline Project (CS-24) is to evaluate the project features and identify any deficiencies. Information from the inspection will be used to prepare a report detailing the condition of project features and any corrective actions recommended. Should it be determined that corrective actions are needed, OCPR shall provide, in the report, a detailed cost estimate for engineering, design, supervision, inspection, and construction contingencies, and an assessment of the urgency of such repairs. The annual inspection report also contains a summary of maintenance projects which were completed since completion of constructed project features and an estimated projected budget for the upcoming three (3) years for operation, maintenance and rehabilitation. The three (3) year projected operation and maintenance budget is shown in Appendix B.

An annual O & M inspection of the Perry Ridge Shoreline Project (CS-24) was held on November 27, 2007 under sunny skies and mild temperatures. In attendance were Mel Guidry, Stan Aucoin, Darrell Pontiff and Tommy McGinnis of OCPR, along with Dale Garber representing NRCS. The inspection began at 11:00 am at the eastern end of the project.

The field inspection included a complete visual inspection of the entire project site. Staff gauge readings and existing temporary benchmarks were used to determine approximate water elevation and existing elevation of the foreshore rock dike. Photographs were taken of the foreshore rock dike (see Appendix A) and Field Inspection notes were completed in the field to record measurements and deficiencies (see Appendix C).

b. Inspection Results

Site 1—Foreshore rock dike

The dike is in excellent condition with some very small areas being below constructed elevation. Visible signs of accretion are occurring behind the rock dike in some areas. No maintenance is recommended at this time. (Photos: Appendix A, Photos 1, 2 & 3)

c. Maintenance Recommendations

i. Immediate/ Emergency Repairs

None

ii. Programmatic/ Routine Repairs

None

II. Maintenance Activity (continued)

d. Maintenance History

General Maintenance: Below is a summary of completed maintenance projects and operation tasks performed since February 1999, the construction completion date of the Perry Ridge Shoreline Protection Project (CS-24).

There has been no maintenance on this project.

III. Operation Activity

a. Operation Plan

There are no water control structures associated with this project; therefore no Structural Operation Plan is required.

b. Actual Operations

There are no water control structures associated with this project, therefore no required structural operations.

IV. Monitoring Activity

Pursuant to a CWPPRA Task Force decision on August 14, 2003 to adopt the Coastwide Reference Monitoring System-*Wetlands* (CRMS-*Wetlands*) for CWPPRA, updates were made to the CS-24 Monitoring Plan to merge it with CRMS-*Wetlands* and provide more useful information for modeling efforts and future project planning while maintaining the monitoring mandates of the Breaux Act.

a. Monitoring Goals

The objectives of the Perry Ridge Shore Protection Project are:

1. Protect the existing emergent wetlands along the north bank of the GIWW and prevent their further deterioration from shoreline erosion and tidal scour.
2. Prevent the widening of the GIWW into the project area wetlands.
3. Reduce the occurrence of salinity spikes within the project area.

The following goals will contribute to the evaluation of the above objectives:

1. Decrease the rate of shoreline erosion along the north bank of the GIWW using a rock dike.

b. Monitoring Elements

Aerial Photography:
To document shoreline position, and land and water areas along the GIWW in the project and reference areas, near-vertical, color-infrared aerial photography (1:12,000 scale, with ground controls) was obtained once prior to construction in 1997, and in post-construction 2001. The original photography was checked for flight accuracy, color correctness, and clarity and was subsequently archived. Aerial photography was scanned, mosaicked, and georectified by USGS/NWRC personnel according to standard operating procedures (Steyer et al. 1995, revised 2000). No additional land-water photography will be collected.

Shoreline Change:
To document changes in shoreline position along the GIWW, shoreline markers were placed at 12 points along the vegetated marsh edge adjacent to the rock breakwater. Twelve transects were measured and differentiated by shoreline type in the project and reference areas (minimum of 3 but not to exceed 1 per 1,000 ft [305 m]). On each transect, a PVC pole was installed to mark the vegetated edge of the bank (VEB), and a post was installed at the end point in the marsh or on the spoil bank to establish a hub for use in relocating each transect. Shoreline position relative to the shoreline markers along the transects was documented at the same time of the year, once as-built in 1999, and post-construction in 2002, 2004 and 2007, and will be documented in 2010, 2013, and 2016.

Salinity:
Salinity measurements were recommended to be collected for one year after the next significant drought after 1996 to determine the rock dike's effect on salinity spikes in the project area behind the dike.

c. Preliminary Monitoring Results and Discussion

Aerial Photography:
Pre-construction photography, flown on November 23, 1997, indicated that the project area was 60.4% land and 39.6% water (Figures 2 and 3). Aerial photography flown on November 17, 2001 documented 65.4% land and 34.6% water in the project area, indicating a land gain of 5% or 306.5 ac (124.0 ha). The higher land to water ratio indicates expansion of the interior marsh behind the protected shoreline. In areas without shoreline protection, the western reference area remained 58.8% land and 41.2% water, and the eastern reference area made a slight gain from 61.4% land and 38.6% water in 1997 to 62.7% land and 37.3% in 2001.

Shoreline Position:
The average rate of gain in the project area behind the rock dike was 1.83 ft/yr (0.56 m/yr) from 1999-2002, 1.61 ft/yr (0.49m/yr) from 2002-2004, and 1.96 ft/yr (0.60 m/yr) from 2004-2007. The rate of erosion in the reference area was -2.8 ft/yr (-0.85 m/yr), -2.6 ft/yr (-0.79m/yr), and -1.7 ft/yr (-0.52 m/yr), respectively (figure 4). The 2007 data indicate that 17 of 25 monitoring stations along the shoreline in the project area are prograding while the shoreline position at all reference sites continues to retreat (Table 1, Figure 5).

Salinity:
To evaluate the project's effect on salinity, data were collected hourly at 2 stations from June 2000 through June 2001. One station was located in the project area, and the other one in the GIWW. The recorders malfunctioned and no data was collected. Therefore, the effectiveness of the rock dike at reducing the occurrence of salinity spikes within the project area cannot be determined. There are no plans to monitor salinity spikes in the future.

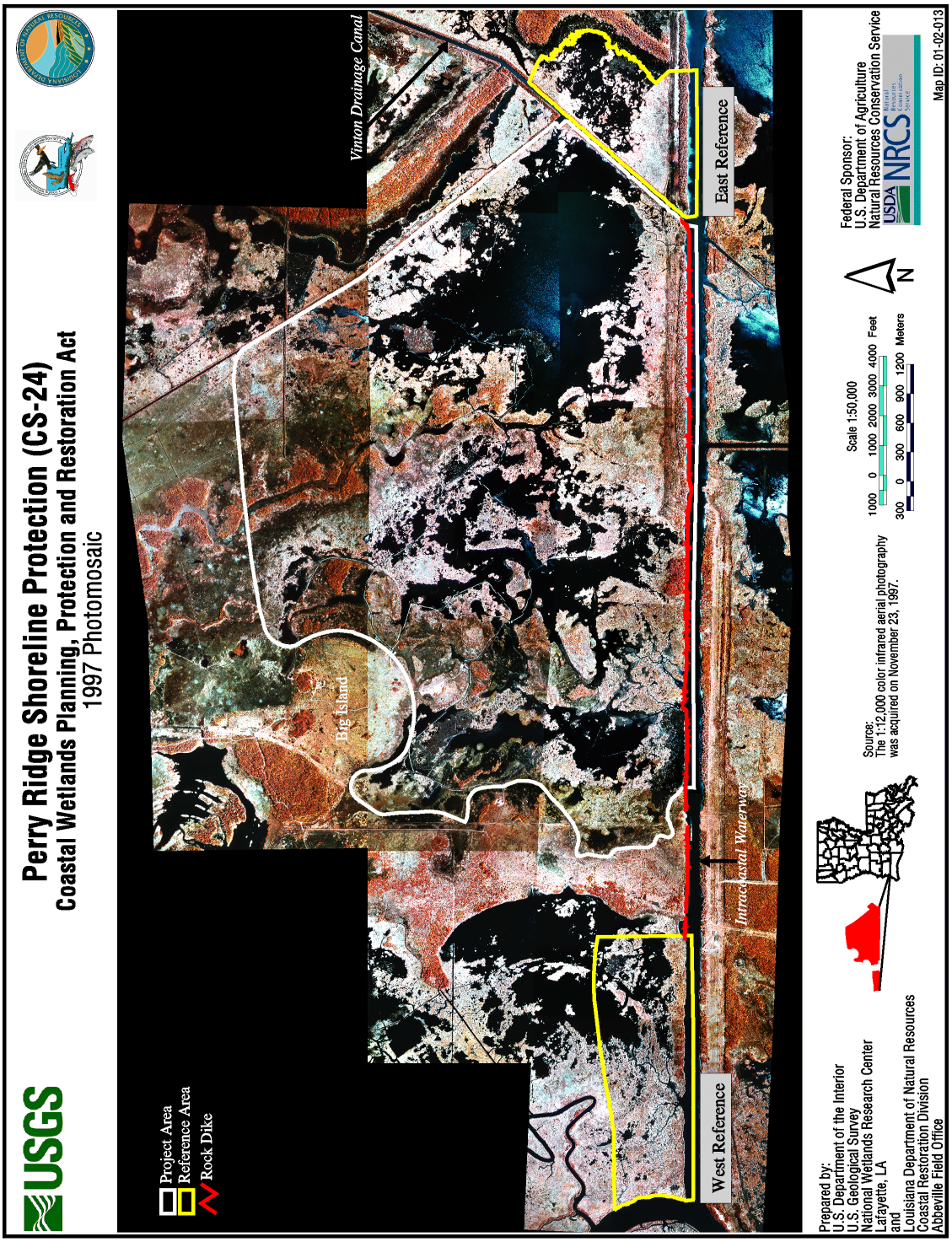

Figure 2. Photomosaic of the Perry Ridge Shore Protection (CS-24) project and reference areas from aerial photography flown November 23, 1997

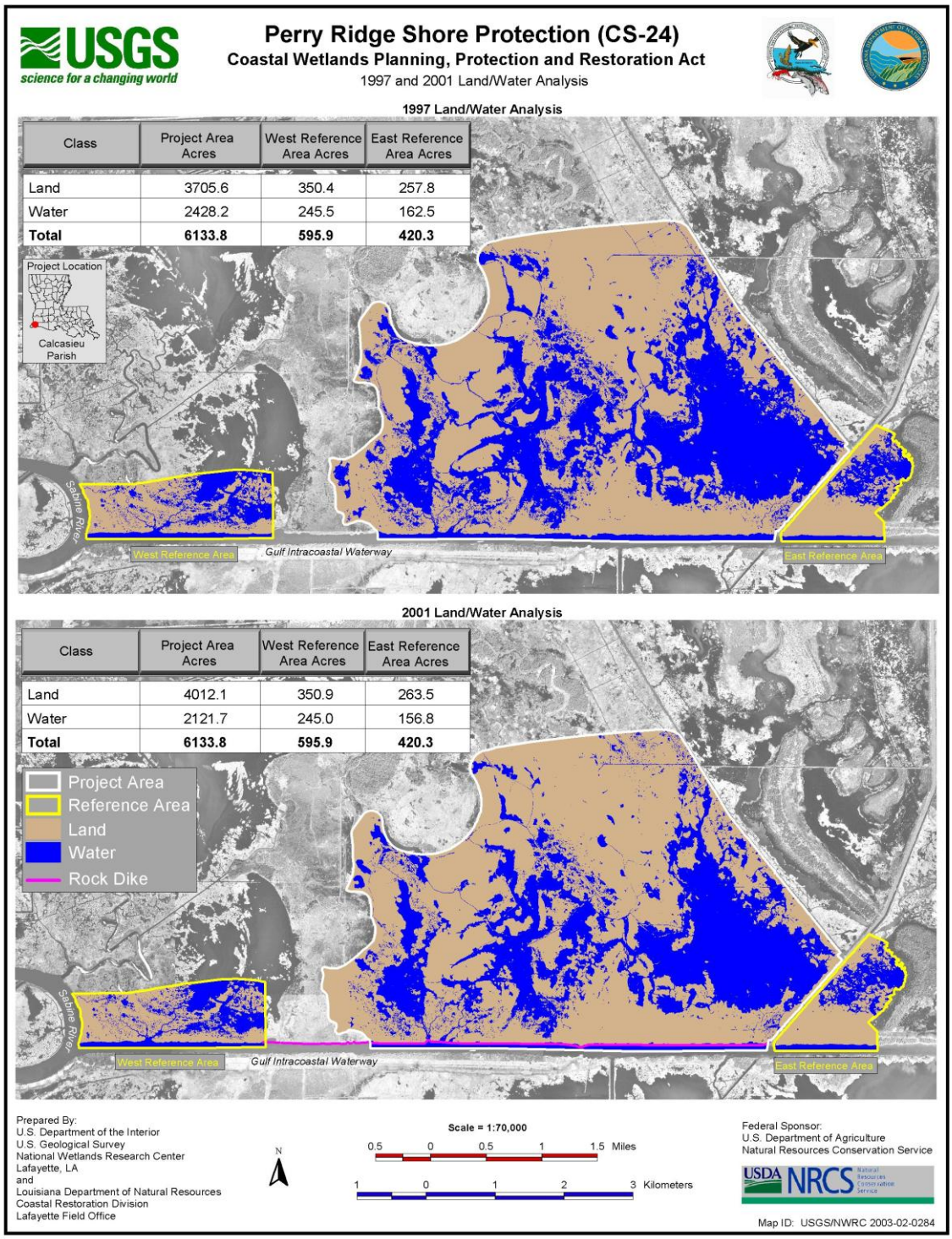

Figure 3. Pre- and Post-construction land/water analysis of the Perry Ridge Shore Protection (CS-24) project.

Figure 4. Perry Ridge Shore Protection (CS-24) shoreline marker station locations.

Table 1. Shoreline measurements for within the CS-24 project area and reference areas for March 1999 and July 2002, 2004 and 2007.

Shoreline Marker Data								
Project Number	Station #	Group	Distance to Vegetated Edge (ft)					
			1999	2002	2004		2007	
C/S-24	CS24-01	Project	15.10	8.10	7.6		7.40	
C/S-24	CS24-02	Project	28.55	25.70	27.2		25.70	
C/S-24	CS24-03	Project	24.95	22.40	22.3		26.70	
C/S-24	CS24-04	Project	16.10	15.70	10.8		9.90	
C/S-24	CS24-05	Project	49.45	47.50	46.6		46.00	
C/S-24	CS24-06	Project	51.30	53.40	48.6		57.50	
C/S-24	CS24-07	Project	16.00	8.10	6		4.80	
C/S-24	CS24-08	Project	58.50	28.20	43.9		33.00	
C/S-24	CS24-09	Project	34.50	41.80	36.6		42.30	
C/S-24	CS24-10	Project	101.30	241.60	235.5		241.70	
C/S-24	CS24-11	Project	13.00	15.80	12.4		13.30	
C/S-24	CS24-12	Project	10.80	7.70	9.8		7.70	
C/S-24	CS24-13	Project	29.30	26.00	26.6		23.50	
C/S-24	CS24-14	Project	26.30	23.30	18		5.20	
C/S-24	CS24-15	Project	98.45	93.90	92.1		91.60	
C/S-24	CS24-16	Project	113.50	103.20	101.1		98.90	
C/S-24	CS24-17	Project	139.40	120.60	115.5		104.70	
C/S-24	CS24-18	Project	82.90	76.60	75.3		43.40	
C/S-24	CS24-19	Project	70.65	60.40	52.1		9.80	
C/S-24	CS24-20	Project	80.15	69.20	67.3		8.10	
C/S-24	CS24-21	Project	66.20	49.20	7.5		5.80	
C/S-24	CS24-22	Project	89.95	89.40	88.4		98.90	
C/S-24	CS24-23	Project	63.85	57.50	59		55.30	
C/S-24	CS24-24	Project	120.20	119.30	118.6		121.40	
C/S-24	CS24-25	Project	38.70	43.30	38.7		37.70	
C/S-24	CS24-01R	Reference	50.00	43.90	40.1		30.30	
C/S-24	CS24-02R	Reference	50.00	39.70	38.5		37.20	
C/S-24	CS24-09R	Reference	50.00	41.60	31		26.90	
* Distances were measured from settlement plates to vegetated edge for project area and to vegetated edge from survey hub for reference area by direct (tape) measurement.								

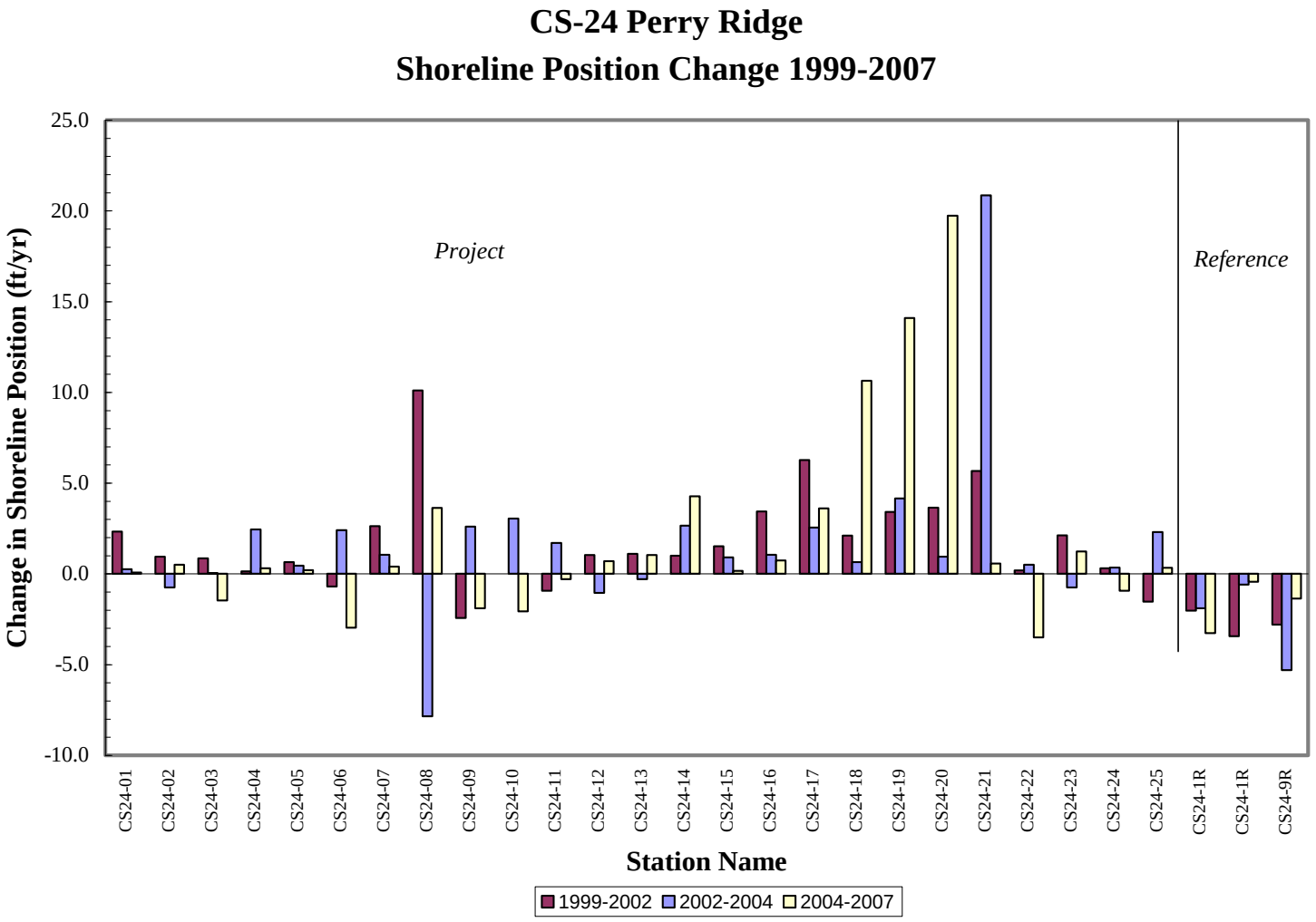

Figure 5. Shoreline position change (ft/yr) from direct measurements in the Perry Ridge (CS-24) project area from 2004-2007.

V. Conclusions

a. Project Effectiveness

The 2007 shoreline survey indicates the project has been effective at preventing shoreline erosion. The average rate of gain over all 25 project stations was 1.96 ft/yr (0.6 m/yr) while the shoreline in the reference area stations continued to retreat at a rate of -1.7 ft/yr (0.52 m/yr). Visual observation indicates vertical accretion of the wetland area at 17 of 25 monitoring stations between the foreshore rock dike and the shoreline. The next shoreline marker survey is scheduled for the summer of 2010. The structural components of the Perry Ridge Shoreline Protection Project are in good condition and functioning as designed.

b. Recommended Improvements

No improvements are currently being recommended.

c. Lessons Learned

VI. Literature Cited

Chabreck, R. H., T. Joanen, and A. W. Palmisano 1968. Vegetation type map of the Louisiana coastal marshes. Louisiana Department of Wildlife and Fisheries, New Orleans. Scale 1:62,500.

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APPENDIX A
(Inspection Photographs)

Photo 1, Typical rock dike.

Photo 2, Rock dike tie-in on eastern end.

Photo 3, View showing accretion behind rock dike.

APPENDIX B
(Three Year Budget Projection)

PERRY RIDGE SHORELINE PROTECTION/ CS-24 /PPL 4

Three-Year Operations & Maintenance Budgets 07/01/2008 - 06/30/2011

Project Manager	O & M Manager	Federal Sponsor	Prepared By
Pat Landry	*Mel Guidry*	*NRCS*	*Mel Guidry*

	2008/2009	2009/2010	2010/2011
Maintenance Inspection	$ 5,570.00	$ 5,737.00	$ 5,909.00
Structure Operation			
Administration		$ -	$ -
Maintenance/Rehabilitation			

08/09 Description:

E&D	
Construction	
Construction Oversight	
Sub Total - Maint. And Rehab.	$ -

09/10 Description

E&D	$ -
Construction	$ -
Construction Oversight	$ -
Sub Total - Maint. And Rehab.	$ -

10/11 Description:

E&D	$ -
Construction	$ -
Construction Oversight	$ -
Sub Total - Maint. And Rehab.	$ -

	2008/2009	2009/2010	2010/2011
Total O&M Budgets	**$ 5,570.00**	**$ 5,737.00**	**$ 5,909.00**

O &M Budget (3 yr Total)	**$ 17,216.00**
Unexpended O & M Budget	**$ 391,844.80**
Remaining O & M Budget (Projected)	**$ 374,628.80**

OPERATION AND MAINTENANCE BUDGET 07/01/2008-06/30/2009

PERRY RIDGE SHORE PROTECTION/CS-24/PPL4

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	$5,570.00	**$5,570.00**
General Structure Maintenance	LUMP	1	$0.00	**$0.00**
Engineering and Design	LUMP	1	$0.00	**$0.00**
Operations Contract	LUMP	1	$0.00	**$0.00**
Construction Oversight	LUMP	1	$0.00	**$0.00**

ADMINISTRATION

LDNR / CRD Admin.	LUMP	0	$0.00	$0.00
FEDERAL SPONSER Admin.	LUMP	0	$0.00	$0.00
SURVEY Admin.	LUMP	0	$0.00	$0.00
OTHER				$0.00
			TOTAL ADMINISTRATION COSTS:	**$0.00**

MAINTENANCE / CONSTRUCTION

SURVEY

SURVEY DESCRIPTION:				
Secondary Monument	EACH	0	$0.00	$0.00
Staff Gauge / Recorders	EACH	0	$0.00	$0.00
Marsh Elevation / Topography	LUMP	0	$0.00	$0.00
TBM Installation	EACH	0	$0.00	$0.00
OTHER				$0.00
			TOTAL SURVEY COSTS:	**$0.00**

GEOTECHNICAL

GEOTECH DESCRIPTION:				
Borings	EACH	0	$0.00	$0.00
OTHER				$0.00
			TOTAL GEOTECHNICAL COSTS:	**$0.00**

CONSTRUCTION

CONSTRUCTION DESCRIPTION:					
Rip Rap	LIN FT	TON / FT	TONS	UNIT PRICE	
	0	0.0	0	$0.00	$0.00
	0	0.0	0	$0.00	$0.00
	0	0.0	0	$0.00	$0.00
Filter Cloth / Geogrid Fabric		SQ YD	0	$0.00	$0.00
Navagation Aid		EACH	0	$0.00	$0.00
Signage		EACH	0	$0.00	$0.00
General Excavation / Fill		CU YD	0	$0.00	$0.00
Dredging		CU YD	0	$0.00	$0.00
Sheet Piles (Lin Ft or Sq Yds)			0	$0.00	$0.00
Timber Piles (each or lump sum)			0	$0.00	$0.00
Timber Members (each or lump sum)			0	$0.00	$0.00
Hardware		LUMP	1	$0.00	$0.00
Materials		LUMP	1	$0.00	$0.00
Mob / Demob		LUMP	1	$0.00	$0.00
Contingency		LUMP	1	$0.00	$0.00
General Structure Maintenance		LUMP	1	$0.00	$0.00
OTHER				$0.00	$0.00
OTHER				$0.00	$0.00
OTHER				$0.00	$0.00
				TOTAL CONSTRUCTION COSTS:	**$0.00**

TOTAL OPERATIONS AND MAINTENANCE BUDGET: **$5,570.00**

OPERATION AND MAINTENANCE BUDGET 07/01/2009-06/30/2010

PERRY RIDGE SHORE PROTECTION/CS-24/PPL4

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	$5,737.00	**$5,737.00**
General Structure Maintenance	LUMP	1	$0.00	**$0.00**
Engineering and Design	LUMP	1	$0.00	**$0.00**
Operations Contract	LUMP	1	$0.00	**$0.00**
Construction Oversight	LUMP	1	$0.00	**$0.00**

ADMINISTRATION

LDNR / CRD Admin.	LUMP	0	$0.00	$0.00
FEDERAL SPONSER Admin.	LUMP	0	$0.00	$0.00
SURVEY Admin.	LUMP	0	$0.00	$0.00
OTHER				$0.00
			TOTAL ADMINISTRATION COSTS:	**$0.00**

MAINTENANCE / CONSTRUCTION

SURVEY

SURVEY DESCRIPTION:				
Secondary Monument	EACH	0	$0.00	$0.00
Staff Gauge / Recorders	EACH	0	$0.00	$0.00
Marsh Elevation / Topography	LUMP	0	$0.00	$0.00
TBM Installation	EACH	0	$0.00	$0.00
OTHER				$0.00
			TOTAL SURVEY COSTS:	**$0.00**

GEOTECHNICAL

GEOTECH DESCRIPTION:				
Borings	EACH	0	$0.00	$0.00
OTHER				$0.00
			TOTAL GEOTECHNICAL COSTS:	**$0.00**

CONSTRUCTION

CONSTRUCTION DESCRIPTION:					
Rip Rap	LIN FT	TON / FT	TONS	UNIT PRICE	
	0	0.0	0	$0.00	$0.00
	0	0.0	0	$0.00	$0.00
	0	0.0	0	$0.00	$0.00
Filter Cloth / Geogrid Fabric		SQ YD	0	$0.00	$0.00
Navagation Aid		EACH	0	$0.00	$0.00
Signage		EACH	0	$0.00	$0.00
General Excavation / Fill		CU YD	0	$0.00	$0.00
Dredging		CU YD	0	$0.00	$0.00
Sheet Piles (Lin Ft or Sq Yds)			0	$0.00	$0.00
Timber Piles (each or lump sum)			0	$0.00	$0.00
Timber Members (each or lump sum)			0	$0.00	$0.00
Hardware		LUMP	1	$0.00	$0.00
Materials		LUMP	1	$0.00	$0.00
Mob / Demob		LUMP	1	$0.00	$0.00
Contingency		LUMP	1	$0.00	$0.00
General Structure Maintenance		LUMP	1	$0.00	$0.00
OTHER				$0.00	$0.00
OTHER				$0.00	$0.00
OTHER				$0.00	$0.00
				TOTAL CONSTRUCTION COSTS:	**$0.00**

TOTAL OPERATIONS AND MAINTENANCE BUDGET: **$5,737.00**

OPERATION AND MAINTENANCE BUDGET 07/01/2010-06/30/2011

PERRY RIDGE SHORE PROTECTION/CS-24/PPL4

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	$5,909.00	**$5,909.00**
General Structure Maintenance	LUMP	1	$0.00	**$0.00**
Engineering and Design	LUMP	1	$0.00	**$0.00**
Operations Contract	LUMP	1	$0.00	**$0.00**
Construction Oversight	LUMP	1	$0.00	**$0.00**

ADMINISTRATION

LDNR / CRD Admin.	LUMP	1	$0.00	$0.00
FEDERAL SPONSER Admin.	LUMP	1	$0.00	$0.00
SURVEY Admin.	LUMP	1	$0.00	$0.00
OTHER				$0.00
			TOTAL ADMINISTRATION COSTS:	**$0.00**

MAINTENANCE / CONSTRUCTION

SURVEY

SURVEY DESCRIPTION:					
Secondary Monument		EACH	0	$0.00	$0.00
Staff Gauge / Recorders		EACH	0	$0.00	$0.00
Marsh Elevation / Topography		LUMP	0	$0.00	$0.00
TBM Installation		EACH	0	$0.00	$0.00
OTHER					$0.00
				TOTAL SURVEY COSTS:	**$0.00**

GEOTECHNICAL

GEOTECH DESCRIPTION:					
Borings		EACH	0	$0.00	$0.00
OTHER					$0.00
				TOTAL GEOTECHNICAL COSTS:	**$0.00**

CONSTRUCTION

CONSTRUCTION DESCRIPTION:					
Rip Rap	LIN FT	TON / FT	TONS	UNIT PRICE	
	0	0.0	0	$0.00	$0.00
	0	0.0	0	$0.00	$0.00
	0	0.0	0	$0.00	$0.00
Filter Cloth / Geogrid Fabric		SQ YD	0	$0.00	$0.00
Navagation Aid		EACH	0	$0.00	$0.00
Signage		EACH	0	$0.00	$0.00
General Excavation / Fill		CU YD	0	$0.00	$0.00
Dredging		CU YD	0	$0.00	$0.00
Sheet Piles (Lin Ft or Sq Yds)			0	$0.00	$0.00
Timber Piles (each or lump sum)			0	$0.00	$0.00
Timber Members (each or lump sum)			0	$0.00	$0.00
Hardware		LUMP	1	$0.00	$0.00
Materials		LUMP	1	$0.00	$0.00
Mob / Demob		LUMP	1	$0.00	$0.00
Contingency		LUMP	1	$0.00	$0.00
General Structure Maintenance		LUMP	1	$0.00	$0.00
OTHER				$0.00	$0.00
OTHER				$0.00	$0.00
OTHER				$0.00	$0.00
				TOTAL CONSTRUCTION COSTS:	**$0.00**

TOTAL OPERATIONS AND MAINTENANCE BUDGET: **$5,909.00**

APPENDIX C
(Field Inspection Notes)

MAINTENANCE INSPECTION REPORT CHECK SHEET

Project No. / Name: CS-24 Perry Ridge Shoreline Protection

Date of Inspection: November 27, 2007 Time: 11:00 am

Structure No.

Inspector(s): Stan Aucoin, Mel Guidry & Darrell Pontiff (OCPR)
Tommy McGinnis (OCPR), Dale Garber (NRCS)

Structure Description: Rock Dike

Water Level

Type of Inspection: Annual

Weather Conditions: Clear & mild

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Steel Bulkhead / Caps	N/A				
Steel Grating	N/A				
Stop Logs	N/A				
Hardware	N/A				
Timber Piles	N/A				
Timber Wales	N/A				
Galv. Pile Caps	N/A				
Cables	N/A				
Signage /Supports	N/A				
Rip Rap (fill) (foreshore dike)	Good			1, 2 & 3	Accretion occurring behind rock dike.
Earthen Embankment	N/A				

What are the conditions of the existing levees?
Are there any noticeable breaches?
Settlement of rock plugs and rock weirs?
Position of stoplogs at the time of the inspection?
Are there any signs of vandalism?